Remarks

Claims 7-36 and 42 are pending.

Claims 1-6 and Claims 37-41 have all been canceled, without prejudice.

Claim 12 was amended to recite continuously displaying in about real-time the geographic information regarding the another track section occupied by the train. See, for example, page 13, lines 28-30 ("Hence, another sequence of messages 112,116,120,128 responsively causes an efficient update of the features 90,90′,90′′ of the GIS map 86 (Figure 7) in near real-time for communications over the Internet 52."), and page 11, lines 5-8 ("The updated train position feature 90 is sent as a streaming vector 97 over the Internet 52 to the train location display applet 70, which runs on the web browser 68. The train location display applet 70, in turn, applies the streaming vector train position feature 90 to the displayed GIS map 86.") of the specification.

Claim 42 was added. See, for example, Figures 3 and 7 and the corresponding disclosure. See, also, page 11, lines 9-13 of the specification. As to the embodiment of Figure 2, it is submitted that newly added Claim 42 reads thereon.

A Fee Sheet and duplicate copy thereof accompany this Amendment.

REJECTIONS UNDER 35 U.S.C. § 103(a)

The Examiner rejects Claims 7-10, 17-23 and 26-30 on the ground of being unpatentable over U.S. Patent No. 6,871,137 (Scaer et al.) in view of U.S. Patent Application Publication No. 2002/0010531 (Hawthorne et al.).

Scaer et al. discloses a web-based transportation decision support system and geographic information system (GIS) application that uses intelligent transportation system (ITS) information available from federal, state, local, and commercial transportation sources. The system provides users with road and rail information about routes and infrastructure characteristics, as well as real-time information from cameras, speed sensors, construction and accident reporting systems, and GIS based weather. Additionally, the system provides users with the immediate ability to track and report surface shipments on an extremely accurate spatial data background.

Scaer et al. states in connection with Figure 1 that a user's area of study may involve accurate routing and driving directions. After the user selects a destination and a starting location, the system 10 processes the request, gathers relevant data from the routing server 29 and other servers 20 to generate a map and accurate and detailed turn-by-turn, address-to-address, or latitude/longitude driving directions with total drive time and mileage. In Figure 4, the user's initial selections on screen 400 (i.e., simply moving the cursor over the

selected options 402, 404, 406) cause the system 10 to immediately display a table 408 of stored data relating to the selected location Hampton Roads, here including any alias, city location, geographic code, region, latitude and longitude and distance to open water. As shown in Figure 1, each server 20 of the system 10 of Scaer et al. is communicably connected to a data source geared towards particular GIS, ITS, or meteorological data. For example, the meteorological weather server 26 is communicably connected to weather-gathering equipment and databases, such as, for example Doppler radar equipment and databases. The tracking server 24 is communicably connected to GPS data sources, vehicle dispatch systems, and traffic databases. The routing server 29 is communicably connected to surface, water, and air transportation databases including traffic and congestion information. The application server 28 runs specific applications such as data conversion and formatting, and its output feeds the web server 22.

The software of the system 10 provides for mapping capability using GIS and mapping technologies to generate and display high-quality mapping data as one or more basemaps, and to overlay selected data layers over the basemaps. The graphic displays include layers that can be selected and adjusted by the user, or alternatively can be automatically selected and adjusted based on rules that will cause the most relevant data layers to be displayed, yet allow the user to toggle between various layers to alter the data presented in the graphic display. As shown in Figure 7 of the reference, in response to clicking on the data layers function 106, the software displays layer selection functions 130 that can be toggled on/off by the user at his/her discretion to alter the displayed map by adding or removing layers of particular interest to the user. As shown, the data layers 130 include, but are not limited to, display of city names, installation names, road names and labels, road shields, terminals, urban areas, water, counties, rail lines, highways, local roads, major roads, minor roads, road names. Additional (not shown) data layers 130 include topography, aerial photos, roads and road names, railroads, detailed railways, points of interest, bridges, weather, traffic events, overhead photo, overhead flight, route cameras, national guard, military and governmental nodes, real-time information (such as photographic or video images), video logs, video exits, and vehicle GPS tracking (in-transit visibility).

The system 10 also has the ability to access information concerning rail transportation. As shown in Figure 13, activation of the Rail Status function 110 results in a display of screen 1300 having a base map showing layers for a selected area of study, the layers including rail lines in the geographic area of concern. Additionally, the screen 1300 allows the user to focus on particular data layers, or to gather and display additional rail

information, by selecting from primary options 1302. Primary options 1302 may include, for example, focus on primary rail lines, a find function for rail lines, status reports for the indicated rail lines, and a find function for one or more rail carriers. For example, selecting the primary option Primary Rail Line, or alternatively clicking on a displayed rail line, results in the display of a window 1400 containing a table of data 408, in this case relating to the infrastructure and other feature of the selected rail line, as illustrated in Figure 14. Additionally, viewing options 1304 (Figure 13) are provided to allow a user to refresh a map, print the map, and list the data layers available for the area of study and resulting map. Optionally, a layer listing 130 is provided to enable a user to choose the layers that are displayed.

Table 1 of Scaer et al. states that the IRRIS Tracking Subsystem Data Sources Vehicle Tracking QUALCOMM provides the communications Vendor (Qualcomm) infrastructure (satellites, NMCs, tracking devices, etc.) for the IRRIS tracking subsystem. This includes, among other data, freight GPS locational information (latitude, longitude, bearing, speed), as well as messaging data. As shown in Figure 15 of Scaer et al., user input fields 1502 allow a user to select from a geographic location. As with any displayed map, the geographic location can be automatically filled in by clicking on the location on the last displayed map, resulting in population of the geographic location field 1502 with the latitude and longitude corresponding to the location selected by the user.

Hawthorne et al. discloses a method using position data being determined on a train 10 to determine characteristics of that train 10 and/or a track 18. Position determining devices are provided at two or more spaced locations along such train 10. The position of the two locations are determined by the position determining devices. A processor determines the difference between the two locations from the positions determined by the position determining devices and determines the characteristics of the train 10 from the determined difference between the two locations. The position or elevation determining devices include Global Positioning Systems. For example, the length of the train 10 may be determined from the difference of the longitude and latitude of the position determining devices in locomotives 12 and 14 of the same train 10. If the train 10 is not completely stretched or bunched, the cars may be in a process of run-in or run-out. The number of vehicles in the train 10 is determined either from a listing of the vehicles on the train 10 or from the number of axles recorded in a hot box detection system on the train 10.

Track structure and other information about the track may also be collected as the train 10 traverses the track 18. As shown in Figure 2, the GPS information, as well as the

information of the distance travel from the axle generator or tachometer information, are collected as a function of position or time and correlated with structures relative the current location. If there are track structures which are of interest and that are to be correlated with the train location, they are manually or automatically determined and inputted. This information includes one or more mile posts, bridges, tunnels, signals, crossings, overpasses, underpasses, sidings, parallel track and whistle posts. The manual entry would be by the engineer or another observer in the lead locomotive 12 of the train 10. There may also be someone in the trail locomotive 14 of the same train 10. If the particular track structure has a transponder, the train 10 can automatically correlate the information with the position as it passes by and receives the signal from the transponder.

More than two navigational receivers or GPS systems may be provided throughout the train 10. If such information is provided, then multiple segments can be measured which would indicate the length of that segment as well as whether that segment is in run-in or run-out and also to be used as reflection of in-train forces for that segment. Also, it will provide a more accurate determination of the elevation or curvature for that segment between a pair of navigational receivers or position determining devices. By knowing the position of at least two points of the train 10, a more accurate determination of where the train 10 is on the track 18 may be determined by comparison with prestored data bases. This position can be displayed or used.

Claim 7 recites a method for displaying geographic roadway data, geographic track data, and geographic position data for a train comprising: employing a geographic information system database; entering static roadway data in the geographic information system database; entering static track data in the geographic information system database; determining a track section occupied by the train; determining geographic starting and ending positions of the track section; displaying geographic information regarding the static roadway data and the static track data from the geographic information system database; determining geographic information regarding the track section occupied by the train from the geographic starting and ending positions of the track section and from the geographic information system database; and displaying the geographic information regarding the track section occupied by the train with the geographic information regarding the static roadway data and the static track data.

The Examiner states that Scaer et al. does not disclose relating the detected position of a train with respect to a particular section of track.

Hawthorne et al. does not teach or suggest any geographic information system database including static roadway data, although it purports (Paragraph 36) to determine where a train 10 is on a track 18 by knowing the position of at least two points of the train 10 and comparing these points with prestored data bases. This position can be displayed.

Scaer et al., which employs vehicle GPS tracking to track the movement of vehicles and display the position of vehicles on a GIS display, does not teach or suggest any track section, much less determining a track section occupied by a train.

Hawthorne et al., which determines which of two parallel tracks a train is on (Figures 4A, 4B and 5; Paragraphs 11, 34-36 and 38-40), and which (Figure 2) collects information regarding one or more mile posts, bridges, tunnels, signals, crossings, overpasses, underpasses, sidings, parallel track and whistle posts, does not teach or suggest the refined recital of determining a track ***section occupied by a train*** in combination with determining ***geographic starting and ending positions*** of such track ***section***. Scaer et al., which does not disclose relating the detected position of a train with respect to a particular section of track, adds nothing to Hawthorne et al. in this regard.

As such, the references do not teach or suggest determining geographic information regarding a track ***section occupied by a train*** from ***geographic starting and ending positions*** of a track ***section and*** from a geographic information system database. Furthermore, the references do not teach or suggest displaying such geographic information regarding such track ***section occupied by such train*** with geographic information regarding static roadway data and static track data.

Therefore, for the above reasons, Claim 7 patentably distinguishes over the references.

Claims 8-10, 17-23 and 26-28 depend either directly or indirectly from Claim 1, include all of the limitations thereof, and patentably distinguish over the references for at least the same reasons.

Furthermore, Claim 8 recites storing a starting longitude, a starting latitude, an ending longitude and an ending latitude for each of the track ***sections*** in another database; and determining geographic information regarding the track ***section occupied by the train*** from the starting longitude, the starting latitude, the ending longitude and the ending latitude of the track ***section occupied by the train and*** from the geographic information system database. Since the references do not teach or suggest the limitations of Claim 7, they clearly do not teach or suggest these additional limitations which further patentably distinguish over the references.

Furthermore, Claim 18 recites, *inter alia*, dynamically determining the geographic information regarding the track ***section occupied by the train***; and entering the dynamically determined geographic information in a train position layer of the geographic information system database. Since the references do not teach or suggest the limitations of Claim 7, they clearly do not teach or suggest these additional limitations which further patentably distinguish over the references.

Furthermore, Claim 22 recites determining the track section occupied by the train from a computer aided dispatching system.

Scaer et al., which discloses a road-based vehicle dispatch system, does not teach or suggest determining a track ***section occupied by a train*** from a ***computer aided*** dispatching system. Hawthorne et al., which deals with a system "on a train" (see, for example claim 25 of the reference), adds nothing to Scaer et al. regarding any dispatching system. Hence, Claim 22 further patentably distinguishes over the references.

Claim 29 is an independent claim which recites, *inter alia*, a geographic information system for displaying geographic roadway data, geographic track data, and geographic position data for a train comprising: a geographic information system database including static roadway data and static track data; means for determining a track section occupied by the train; means for determining geographic starting and ending positions of the track section; means for displaying geographic information regarding the static roadway data and the static track data from the geographic information system database; means for determining geographic information regarding the track section occupied by the train from the geographic starting and ending positions of the track section and from the geographic information system database; and means for displaying the geographic information regarding the track section occupied by the train with the geographic information regarding the static roadway data and the static track data.

Hawthorne et al., which determines which of two parallel tracks a train is on (Figures 4A, 4B and 5; Paragraphs 11, 34-36 and 38-40), and which (Figure 2) collects information regarding one or more mile posts, bridges, tunnels, signals, crossings, overpasses, underpasses, sidings, parallel track and whistle posts, does not teach or suggest the refined recital of means for determining a track ***section occupied by a train*** in combination with means for determining ***geographic starting and ending positions*** of such track ***section***. Scaer et al., which does not disclose relating the detected position of a train with respect to a particular section of track, adds nothing to Hawthorne et al. in this regard.

As such, the references do not teach or suggest means for determining geographic information regarding a track ***section occupied by a train*** from ***geographic starting and ending positions*** of a track ***section and*** from a geographic information system database. Furthermore, the references do not teach or suggest means for displaying such geographic information regarding such track ***section occupied by such train*** with geographic information regarding static roadway data and static track data.

Accordingly, for the above reasons, Claim 29 patentably distinguishes over the references.

Claim 30 depends from Claim 29, includes all of the limitations thereof, and patentably distinguishes over the references for at least the same reasons.

Furthermore, Claim 30 recites that the means for determining a track section occupied by a train is a computer aided dispatching system; and that the means for determining geographic starting and ending positions of the track section includes a track infrastructure database.

Scaer et al., which discloses a road-based vehicle dispatch system, does not teach or suggest any means for determining a track ***section occupied by a train*** being a ***computer aided*** dispatching system. Hawthorne et al., which deals with a system "on a train" (see, for example claim 25 of the reference), adds nothing to Scaer et al. regarding any dispatching system. Hence, Claim 30 further patentably distinguishes over the references.

Newly added Claim 42 depends from Claim 7, includes all of the limitations thereof, and patentably distinguishes over the references for at least the same reasons.

Furthermore, Claim 42 recites employing the track section as a first track section; employing the train as a first train; determining the first track section occupied by the first train and a second track section occupied by a second train from a computer aided dispatching system; determining geographic starting and ending positions of the first and second track sections; determining geographic information regarding the first track section occupied by the first train from the geographic starting and ending positions of the first track section and from the geographic information system database; determining geographic information regarding the second track section occupied by the second train from the geographic starting and ending positions of the second track section and from the geographic information system database; and displaying the geographic information regarding the first and second track sections occupied by the first and second trains, respectively, with the geographic information regarding the static roadway data and the static track data.

Scaer et al., which discloses a road-based vehicle dispatch system, does not teach or suggest determining a track ***section occupied by a train*** from a ***computer aided*** dispatching system. Hawthorne et al., which deals with a system "on a train" (see, for example claim 25 of the reference), adds nothing to Scaer et al. regarding any dispatching system. Hence, Claim 42 further patentably distinguishes over the references.

The Examiner rejects Claims 11-16, 24 and 25 on the ground of being unpatentable over Scaer et al. and Hawthorne et al. and further in view of U.S. Patent Application Publication No. 2004/0182969 (Kane et al.).[1]

Kane et al. discloses that train tracks are divided into sections, referred to in the art as blocks. Figure 1 shows an Automated Block Signaling (ABS) system 10 in which a train track 20 is divided into three blocks 30, 40, 50 labeled "A," "B" and "C," respectively. Wayside signals 32, 42 and 52 are associated with each of the respective blocks 20, 40 and 50. The wayside signals 32, 42, 52 include colored lights to provide visual signal information to operators on trains approaching the signals. The signal 52 for block C 50 will be red if a train 60 (not shown) is in block C 50 or if a broken rail has been detected in block C 50. A red signal means stop before entering the block. When the signal 52 in block C 50 is red, the signal 42 in block B 40 is yellow, which signifies that speed should be reduced in preparation for stopping prior to entering the next block C 50. The signal 32 in block A 30 will be green, which signifies no restriction is in place for that block and a train may proceed through the block at maximum authorized speed. The blocks are traditionally sized such that a train may be brought to a stop within one block under worst case conditions (e.g., maximum speed, maximum train weight, etc.), thereby ensuring that a train that had been proceeding at full speed upon entering a yellow block can be brought to a stop before entering a next block if the next block is red.

Kane et al. discloses that a problem shared by such systems is that there is no provision for lifting the restrictive signal in a block if conditions in the next block causing the restrictive signal "clear up." Causing a train to operate under a restrictive signal unnecessarily makes operation of the train less efficient, which increases costs. Kane et al. further discloses a train control system and method that uses signal information from a next block to change a restrictive signal in a block currently occupied by a train to a less restrictive

[1] In connection with Claims 11-16, 24 and 25, at page 5, second and third paragraphs of the Office Action, the Examiner also refers to "sections 0012-0016" of U.S. Patent No. 6,650,998 (Rutledge et al.). Since Rutledge et al. is not cited in this rejection and since it does not include "sections 0012-0016," it is assumed that the Examiner refers to Paragraphs 0012-0016 of Kane et al..

signal if it can be ascertained that the condition causing the more restrictive signal has changed.

Kane et al. discloses (but does not show) an operator pendant 170 connected to a control module 110. The pendant 170 may take the form of an operator display and may be used to display signals from the signal devices 32, 42, 52 to the train operator and to provide other messages to the train operator and receive certain inputs from the train operator.

Kane et al., which discloses blocks 30, 40, 50 and wayside signals 32, 42 and 52, adds nothing to Scaer et al. and Hawthorne et al. regarding determining geographic starting and ending positions of a track section to render Claim 7 unpatentable.

Claims 11-16, 24 and 25 depend directly or indirectly from Claim 7, include all of the limitations thereof, and patentably distinguish over the references for at least the same reasons.

Furthermore, Claim 11 recites determining another track section occupied by the train; determining geographic starting and ending positions of the another track section; determining geographic information regarding the another track section occupied by the train from the geographic starting and ending positions of the another track section and from the geographic information system database; and displaying the geographic information regarding the another track section occupied by the train.

The Examiner states that Scaer et al. and Hawthorne et al. do not teach or suggest determining geographic starting and ending positions of another track section. Kane et al., which displays signals from signal devices 32, 42, 52 to a train operator and provides other messages to the train operator, adds nothing to the other references regarding determining geographic starting and ending positions of another track section; determining geographic information regarding such another track section occupied by a train from such geographic starting and ending positions of such another track section and from a geographic information system database; and displaying such geographic information regarding such another track section occupied by a train. Therefore, Claim 11 further patentably distinguishes over the references.

Furthermore, Claim 12, as amended, recites responding to an event defined by the determining another track section occupied by the train; and ***continuously*** displaying in about ***real-time*** the ***geographic information*** regarding the ***another*** track ***section*** occupied by the train.

Kane et al. adds nothing to Scaer et al. and Hawthorne et al. regarding displaying geographic information regarding a track section occupied by a train.

Although Scaer et al. discloses that the system 10, using a tracking subsystem, can provide real-time in-transit visibility of vehicles and shipments, here, it is submitted that "tracking" means "querying for status," where "status" means the current, but static location of a shipment (or carrier of the shipment). At column 2, lines 45-48 of Scaer et al., it is stated that users have "the immediate ability to track and report surface shipments and vehicle locations on an extremely accurate spatial data background". This implies that the user has the ability to request updates, which are displayed on a map, but that they are not actually receiving ***continuous*** movement information for vehicles in about ***real-time***. In other words, the displayed static information is not continuous. This view is further supported by the sentence beginning at column 2, line 66: "The system further includes a tracking application residing on the at least one server, the tracking application comprising computer instructions for presenting a web-based interface for soliciting a user request for tracking information relating to in-transit shipments, gathering vehicle location information...." Again, the implication is that the user must request tracking information, which prompts the system to retrieve it, rather than information always being ***continuously*** displayed in about ***real time***.

As to Claims 13 and 15, the Examiner states that Scaer et al. and Hawthorne et al. do not teach or suggest clearing any track section or planning any track section.

Again, Kane et al. adds nothing to Scaer et al. and Hawthorne et al. regarding displaying geographic information regarding a track section occupied by a train.

Furthermore, Claim 13 recites clearing another track section to be occupied by the train; determining as a cleared track section the another track section; determining geographic starting and ending positions of the cleared track section; determining geographic information regarding the cleared track section from the geographic starting and ending positions of the cleared track section and from the geographic information system database; and displaying the geographic information regarding the cleared track section with the displayed geographic information regarding the track section occupied by the train.

Kane et al., which discloses signal 32 in block A 30 being green to signify no restriction is in place for that block and a train may proceed through the block at maximum authorized speed, adds nothing to Scaer et al. and Hawthorne et al. regarding determining ***geographic starting and ending positions*** of a ***cleared*** track section; determining geographic information regarding such cleared track section from such geographic starting and ending positions of such cleared track section and from a geographic information system database; and displaying such geographic information regarding such cleared track section with such

displayed geographic information regarding such track section occupied by the train. Therefore, Claim 13 further patentably distinguishes over the references.

Furthermore, Claim 15 recites planning a further track section to be occupied by the train; determining as a planned track section the further track section to be occupied by the train; determining geographic starting and ending positions of the planned track section; determining geographic information regarding the planned track section from the geographic starting and ending positions of the planned track section and from the geographic information system database; and displaying the geographic information regarding the planned track section with the displayed geographic information regarding the track section occupied by the train and with the displayed geographic information regarding the cleared track section.

Kane et al., which discloses signal 32 in block A 30 being green to signify no restriction is in place for that block and a train may proceed through the block at maximum authorized speed, adds nothing to Scaer et al. and Hawthorne et al. regarding ***planning*** a further track section to be occupied by a train. Therefore, the references do not teach or suggest determining ***geographic starting and ending positions*** of a ***planned*** track section; determining geographic information regarding such planned track section from such geographic starting and ending positions of such planned track section and from a geographic information system database; and displaying such geographic information regarding such planned track section with displayed geographic information regarding a track section occupied by a train and with such displayed geographic information regarding a cleared track section. Hence, Claim 15 further patentably distinguishes over the references.

Furthermore, Claim 24 recites determining as a cleared track section another track section cleared to be occupied by the train at a future time; and displaying geographic information regarding the cleared track section with the geographic information regarding the track section occupied by the train. Claim 24 further patentably distinguishes over the references for similar reasons as were discussed above in connection with Claim 13.

Furthermore, Claim 25 recites determining as a planned track section a further track section planned to be occupied by the train at another future time; and displaying geographic information regarding the planned track section with the geographic information regarding the cleared track section and the geographic information regarding the track section occupied by the train. Kane et al., which discloses signal 32 in block A 30 being green to signify no restriction is in place for that block and a train may proceed through the block at maximum authorized speed, adds nothing to Scaer et al. and Hawthorne et al. regarding

determining as a ***planned*** track section a further track section ***planned*** to be occupied by a train at another future time. Claim 25 further patentably distinguishes over the references for similar reasons as were discussed above in connection with Claim 15.

The Examiner rejects Claims 31-36 on the ground of being unpatentable over Scaer et al. and Hawthorne et al. and further in view of U.S. Patent No. 6,650,998 (Rutledge et al.).

Rutledge et al. discloses a map database 145 containing spatial information relating to conventional geographical maps of roads, rivers, streams, vegetation, parks and building patterns and other features complete with legend, border and titles. The geographical area of interest is defined by ranges of latitude and longitude coordinates.

Rutledge et al., which discloses a map database 145, adds nothing to Scaer et al. and Hawthorne et al. regarding any means for determining a track section occupied by a train in combination with means for determining geographic starting and ending positions of such track section, or any computer-aided dispatching system, to render Claim 30 unpatentable.

Claims 31-36 depend directly or indirectly from Claim 30, include all of the limitations thereof, and patentably distinguish over the references for at least the same reasons.

Claim 32 recites that the means for determining geographic information regarding the track section occupied by the train includes a train position routine, which receives from the translation routine the starting latitude, the starting longitude, the ending latitude and the ending longitude and responsively determines at least one of the representations of railroad tracks from the static track data of the geographic information system database; and that the means for displaying the geographic information regarding the track section occupied by the train displays a feature associated with the at least one of the representations of railroad tracks.

Furthermore, Claim 34 recites that the means for displaying the geographic information regarding the track section occupied by the train includes a global communication network, a web browser and a display applet; and that the train position routine stores the feature in the geographic information system database and outputs a streaming vector corresponding to the feature over the global communication network to the display applet.

Rutledge et al. (Figure 1) does not disclose or suggest any display applet, streaming vector or train position. Rutledge et al., which discloses a map database 145

(Figure 1) and a method for a server to enable a user of a user terminal to search a data source accessible by the server, adds nothing to Scaer et al. and Hawthorne et al. regarding any ***train position routine*** that stores a feature in a geographic information system database and outputs a ***streaming*** vector corresponding to such feature over a global communication network to a ***display applet***. Therefore, Claim 34 further patentably distinguishes over the references.

Furthermore, Claim 35 recites that the display applet receives the streaming vector and displays a representation of the feature on a geographic information system map display. Since the references do not teach or suggest the limitations of Claim 34, they clearly neither teach nor suggest these further limitations which further patentably distinguish over the references.

Reconsideration and early allowance are requested.

Respectfully submitted,

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